Trend Study 17-13-02

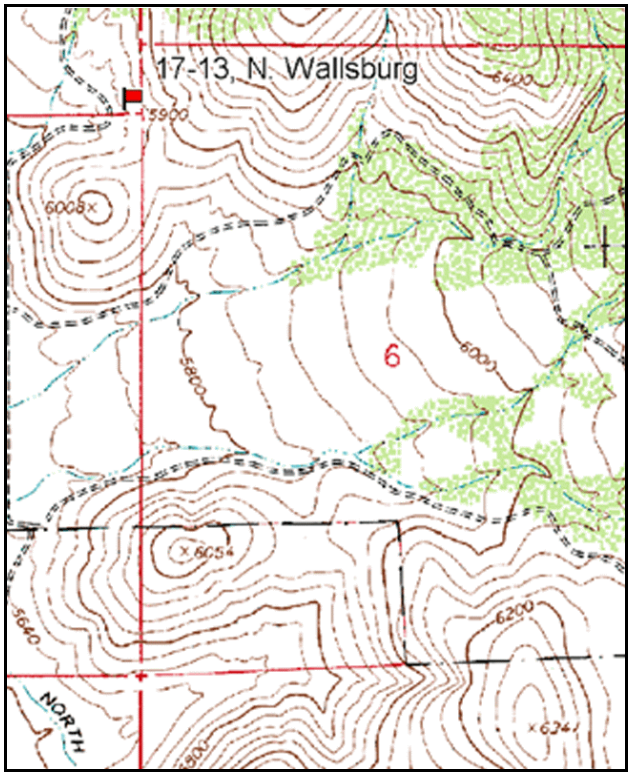
Study site name: North Wallsburg. Vegetation type: Big Sagebrush-Grass.

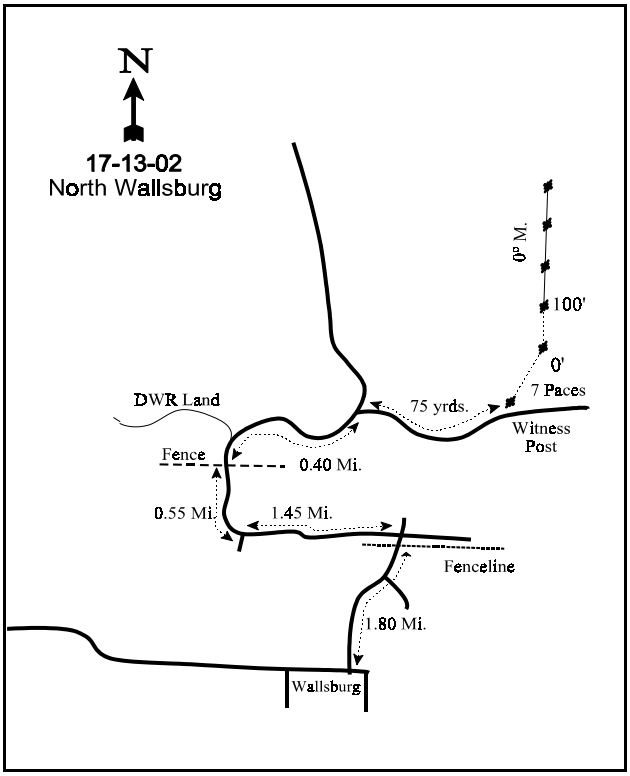
Compass bearing: frequency baseline 0 degrees magnetic.

Frequency belt placement: line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft). Rebar: belt 5 on 5ft.

LOCATION DESCRIPTION

Beginning at the town of Wallsburg, proceed northerly for 1.80 miles staying on the main road. At 1.80 miles the road will come to a fence line and a gate, proceed through the gate and turn left. Proceed west for 1.45 miles to where the road bends northward at the DWR fence line. Continue on the same road northward for 0.55 additional miles to a cattle guard. Cross the fence and take the immediate right fork, then proceed 0.40 miles to another fork in the road. Walk 75 yards up the old road to a red steel fencepost and a full high witness post on the left side of the road and stop. From the fencepost, the 0-foot stake of the baseline is 7 paces to the northeast.





Map Name: Charleston

Diagrammatic Sketch

Township 4S, Range 4E, Section 36

GPS: NAD 27, UTM 12S 4474279 N 463256 E

DISCUSSION

North Wallsburg - Trend Study No. 17-13

This study is on Division of Wildlife Resources property located north of Wallsburg. The study site is typical of the sagebrush-grass communities that were prevalent in the Wallsburg area before a series of wildfires that burned much of the area in the 1960's and 1970's. This particular site is on a moderate (20%), southwest facing slope at an elevation of 6,000 feet. The area reportedly receives heavy deer and light to moderate elk use in winter. A pellet group transect read parallel to the sampling baseline in 2002 estimated 147 deer days use/acre (364 ddu/ha) and 9 elk days use/acre (21 edu/ha).

The soil is classified as a sandy clay loam with an average temperature of 50°F at a depth of 14 inches. Soil is moderately deep with some rocks on the surface and in the profile. Effective rooting depth was nearly 12 inches, and reactivity is neutral (pH of 7.1). Vegetation cover is high, estimated at 44% and 48% in 1996 and 2002 respectively. Most is contributed by perennial grasses. Litter cover is abundant providing 44% and 41% of the surface cover in 1996 and 2002. Cover for bare ground decreased to only 4% in 1996. With drought conditions in 2002, bare soil increased but remains moderately low at 12%. Rock and pavement combine to provide about 16% of the surface cover in 1996 and 2002. Although reported as ongoing in 1983, erosion does not appear to be a serious problem due to the abundant litter and vegetative cover. An erosion condition class assessment in 2002 gave soils a stable rating.

Mountain big sagebrush is the dominant browse with an estimated cover of 9% in 1996, increasing to 14% in 2002. This is mostly a mature population, with moderate decadence. The number of decadent plants in the population was stable in 1996 and 2002 at just over 30%. Although this is a big improvement from the 69% decadence rate in 1989, it is still higher than it should be. In 2002, density slightly increased from 2,240 plants/acre in 1996 to 2,540 plants/acre. Recruitment of the young age classes and seedlings have been moderately low in all years except for 1996. Use has been generally moderate in most years, while vigor has been normal on all but a small portion of the population. Heavy use was higher in both 1983 and 2002, but not at excessive levels. Sagebrush annual growth was poor, averaging only 1.2 inches in 2002. The only other palatable forage sampled on the transect is white-stemmed rubber rabbitbrush. Density of this species was estimated at about 300 plants/acre in 1996 and 2002. Use was light in 2002, but decadence was high (79%) and vigor rated as poor on 29% of the population.

Broom snakeweed increased in density between 1983 and 1996 to 4,500 plants/acre. With drought in 2002, snakeweed density declined to only 520 plants/acre. Decadence and poor vigor increased. Broom snakeweed often decreases during dry periods so this decline is expected. Prickly pear cactus and stickyleaf low rabbitbrush are also present on the site.

Grass cover is abundant, but consists primarily of two less desirable species, cheatgrass and bulbous bluegrass. Bulbous bluegrass is a short-lived perennial that has many of the characteristics of an annual. It dries out early in the summer and provides fine fuels for fire. In 1996, cheatgrass was the dominant species providing 58% of the grass cover and was sampled in 88% of the quadrats. Bulbous bluegrass provided 27% of the grass cover and was sampled in 52% of the quadrats in 1996. In 2002, cheatgrass declined in cover, quadrat frequency, and nested frequency due to the dry conditions. However, bulbous bluegrass increased in cover (7% to 22%), quadrat frequency (52% to 84%), and nested frequency (157 to 285) in 2002. Bulbous bluegrass has steadily increased with every reading since site establishment in 1983. The most desirable grasses on the site include Sandberg bluegrass, Indian ricegrass, bottlebrush squirreltail, crested wheatgrass, and intermediate wheatgrass. However, Sandberg bluegrass is the only one of these that are moderately abundant. The wheatgrasses, including bluebunch, are found in scattered patches throughout the area but are not sampled very well by this transect. Forbs, especially perennial species, have been insignificant on the site in all years and are especially so in 2002. Sum of nested frequency for perennial forbs has steadily declined since 1989.

1983 APPARENT TREND ASSESSMENT

This site appears to be stable. There is little evidence to suggest any great change in either soil condition or vegetative makeup.

1989 TREND ASSESSMENT

The browse component has taken a downward turn. Without treatment, there is little possibility of significant improvement in winter range values for browse. Sagebrush productivity and vigor may improve when the drought ends. Decadency is high and reproduction is low. Numerous winter-killed fawns were found on the site. The herbaceous component did improve with increased sum of nested frequency values for both perennial grasses and forbs. Trend for herbaceous species is up. Erosion pavement increased on the ground surface, while litter cover decreased. Bare soil remains stable at 18%, and erosion is slight. Soil trend is stable.

TREND ASSESSMENT
soil - stable (3)
browse - down (1)
herbaceous understory - up (5)

1996 TREND ASSESSMENT

Soil trend is stable. Erosion is still slight and there is adequate vegetative and litter cover present to prevent or slow erosion. The mountain big sagebrush appears to be healthier than anytime reported in the past. More seedling and young plants were encountered this year, and better vigor and lighter hedging were reported as well. Broom snakeweed may be increasing in density and should be monitored. Browse trend is slightly upward. The herbaceous understory trend is slightly up. Although not included in the surveys in past years, cheatgrass dominates the herbaceous understory. However, both bulbous bluegrass and Sandberg bluegrass nested frequencies have significantly increased since 1983. Forbs are still scarce with most being annual species. It is no wonder why much of the surrounding area has burned in the past. The fine litter provided by cured cheatgrass and bulbous bluegrass provide ample fuel for a destructive fire to occur.

TREND ASSESSMENT
soil - stable (3)
browse - slightly upward (4)
herbaceous understory - up slightly (4)

2002 TREND ASSESSMENT

Soil trend is stable. Bare soil increased to 12%, but vegetation and litter cover are abundant and appear to be stabilizing soils. An erosion assessment completed in 2002 showed stable soil conditions. Trend for browse is stable. Mountain big sagebrush slightly increased in density while decadence and poor vigor remain at 1996 estimates. Sagebrush recruitment is low at 5%, but may improve with better precipitation in the future. Broom snakeweed declined in density due to the drought in 2002. Trend for the herbaceous understory is up slightly but in poor condition. Cheatgrass and bulbous bluegrass remain the dominant species, although they switched places in abundance since 1996. Cheatgrass declined significantly in nested frequency, and cover fell from 16% to 5%. Bulbous bluegrass increased significantly in nested frequency and nearly tripled in cover. Bulbous bluegrass is a poor value perennial that dries out early in the summer and provides little forage. However, it is better than cheat grass. More desirable perennial grasses, bluebunch wheatgrass and Sandberg bluegrass, are present but in low abundance and will likely not increase under the current conditions. Forbs are rare.

TREND ASSESSMENT
soil - stable (3)
browse - stable (3)
herbaceous understory - up slightly but in poor condition (4)

HERBACEOUS TRENDS --
Herd unit 17 , Study no: 13

Type	Species	Nested Frequency				Quadrat Frequency				Average Cover %	
		'83	'89	'96	'02	'83	'89	'96	'02	'96	'02
G	Agropyron cristatum	-	-	-	2	-	-	-	2	-	.03
G	Agropyron intermedium	-	-	-	10	-	-	-	4	-	.68
G	Agropyron smithii	10	14	-	-	4	4	-	-	-	-
G	Bromus tectorum (a)	-	-	$_{b}$303	$_{a}$200	-	-	88	67	16.14	5.23
G	Oryzopsis hymenoides	10	13	6	17	5	8	4	10	.36	.74
G	Poa bulbosa	$_{a}$5	$_{b}$69	$_{c}$157	$_{d}$285	2	33	52	84	7.55	22.75
G	Poa secunda	$_{a}$2	$_{b}$53	$_{c}$166	$_{c}$140	2	22	54	53	3.73	2.66
G	Sitanion hystrix	-	-	9	3	-	-	4	1	.19	.03
G	Stipa comata	-	-	-	4	-	-	-	2	-	.18
Total for Annual Grasses		0	0	303	200	0	0	88	67	16.14	5.23
Total for Perennial Grasses		27	149	338	461	13	67	114	156	11.84	27.09
Total for Grasses		27	149	641	661	13	67	202	223	27.98	32.32
F	Agoseris glauca	-	-	4	-	-	-	2	-	.01	-
F	Alyssum alyssoides (a)	-	-	$_{b}$101	$_{a}$13	-	-	30	6	.69	.03
F	Arabis spp.	-	3	1	-	-	1	1	-	.03	-
F	Astragalus eurekensis	-	-	-	-	-	-	-	-	-	.00
F	Astragalus spp.	3	3	-	-	1	2	-	-	-	-
F	Astragalus utahensis	3	-	1	4	1	-	1	2	.03	.01
F	Calochortus nuttallii	$_{b}$25	$_{c}$112	$_{a}$-	$_{a}$1	12	54	-	1	-	.00
F	Epilobium brachycarpum (a)	-	-	9	-	-	-	4	-	.02	-
F	Erodium cicutarium (a)	-	-	49	28	-	-	17	11	.23	.08
F	Erigeron spp.	-	-	6	-	-	-	3	-	.04	-
F	Eriogonum racemosum	2	6	5	3	1	3	3	1	.01	.00
F	Helianthus annuus (a)	-	-	-	2	-	-	-	1	-	.00
F	Holosteum umbellatum (a)	-	-	$_{a}$-	$_{b}$34	-	-	-	14	-	.11
F	Machaeranthera canescens	2	-	-	-	1	-	-	-	-	-
F	Phlox longifolia	$_{a}$-	$_{b}$21	$_{a}$-	$_{a}$5	-	8	-	2	-	.01
F	Polygonum douglasii (a)	-	-	4	-	-	-	2	-	.01	-
F	Sisymbrium altissimum (a)	-	-	-	5	-	-	-	3	-	.01
F	Tragopogon dubius	$_{a}$1	$_{a}$6	$_{b}$31	$_{a}$-	1	5	18	-	.17	-
F	Zigadenus paniculatus	$_{a}$2	$_{b}$9	$_{a}$-	$_{a}$-	1	6	-	-	-	-
Total for Annual Forbs		0	0	163	82	0	0	53	35	0.95	0.25
Total for Perennial Forbs		38	160	48	13	18	79	28	6	0.29	0.03
Total for Forbs		38	160	211	95	18	79	81	41	1.25	0.28

Values with different subscript letters are significantly different at alpha = 0.10

BROWSE TRENDS --
Herd unit 17 , Study no: 13

Type	Species	Strip Frequency		Average Cover %	
		'96	'02	'96	'02
B	Artemisia tridentata vaseyana	74	71	9.16	13.57
B	Chrysothamnus nauseosus albicaulis	15	14	1.79	1.22
B	Chrysothamnus viscidiflorus viscidiflorus	0	1	-	-
B	Gutierrezia sarothrae	39	14	1.99	.10
B	Opuntia spp.	19	15	.35	.18
Total for Browse		147	115	13.30	15.08

CANOPY COVER -- LINE INTERCEPT
Herd unit 17 , Study no: 13

Species	Percent Cover	
	'96	'02
Artemisia tridentata vaseyana	-	16.08
Chrysothamnus nauseosus albicaulis	-	1.17
Gutierrezia sarothrae	-	.17

Key Browse Annual Leader Growth
Herd unit 17 , Study no: 13

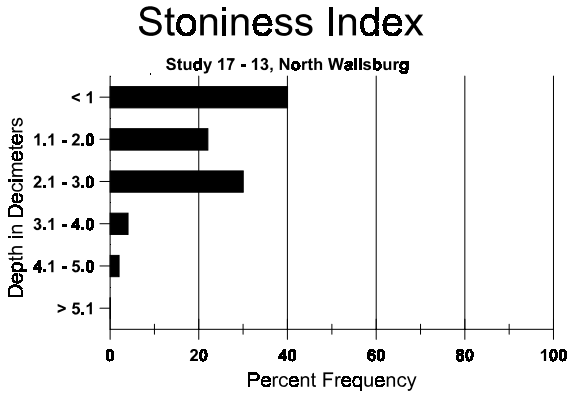
Species	Average leader growth (in)
	'02
Artemisia tridentata vaseyana	1.2

BASIC COVER --
Herd unit 17 , Study no: 13

Cover Type	Nested Frequency		Average Cover %			
	'96	'02	'83	'89	'96	'02
Vegetation	392	369	1.50	4.00	44.31	47.95
Rock	252	241	8.50	8.75	12.07	11.63
Pavement	209	232	3.75	14.00	3.82	4.53
Litter	386	368	64.75	53.25	44.58	41.18
Cryptogams	78	37	3.00	2.00	1.00	.87
Bare Ground	166	219	18.50	18.00	4.32	12.44

SOIL ANALYSIS DATA --
Herd Unit 17, Study no: 13, North Wallsburg

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
11.8	50.0 (14.0)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A



PELLET GROUP FREQUENCY --
Herd unit 17 , Study no: 13

Type	Quadrat Frequency		Pellet Transect	
	'96	'02	Pellet Groups per Acre ⁄02	Days Use per Acre (ha) ⁄02
Sheep	1	-	-	-
Rabbit	11	6	-	-
Elk	12	4	113	9 (21)
Deer	36	47	1914	147 (364)

BROWSE CHARACTERISTICS --
Herd unit 17 , Study no: 13

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia tridentata vaseyana																		
S	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	96	19	-	-	-	-	-	-	-	-	19	-	-	-	380			19
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	83	3	-	-	-	-	-	-	-	-	3	-	-	-	200			3
	89	-	1	-	-	-	-	-	-	-	1	-	-	-	66			1
	96	17	1	-	-	-	-	-	-	-	18	-	-	-	360			18
	02	6	-	-	-	-	-	-	-	-	6	-	-	-	120			6
M	83	11	6	12	-	-	-	-	-	-	29	-	-	-	1933	26	45	29
	89	3	4	-	-	-	-	-	-	-	7	-	-	-	466	22	22	7
	96	33	25	1	-	-	-	-	-	-	59	-	-	-	1180	23	44	59
	02	28	24	23	4	-	-	-	-	-	76	-	-	-	1580	21	30	79
D	83	5	1	5	-	-	-	-	-	-	4	-	7	-	733			11
	89	4	14	-	-	-	-	-	-	-	15	-	-	3	1200			18
	96	10	17	8	-	-	-	-	-	-	26	-	-	9	700			35
	02	9	15	15	2	1	-	-	-	-	28	-	-	14	840			42
X	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	880			44
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	1180			59

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	16%	40%	16%	-40%
'89	73%	00%	12%	+23%
'96	38%	08%	08%	+12%
'02	31%	30%	11%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'83	2866	Dec:	26%
	'89	1732		69%
	'96	2240		31%
	'02	2540		33%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Chrysothamnus nauseosus albicaulis																		
S	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	96	6	-	-	-	-	-	-	-	-	6	-	-	-	120			6
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	96	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	96	10	2	-	-	-	-	-	-	-	12	-	-	-	240	33	50	12
	02	3	-	-	-	-	-	-	-	-	3	-	-	-	60	20	22	3
D	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	96	3	-	1	-	-	-	-	-	-	2	-	-	2	80			4
	02	10	-	-	1	-	-	-	-	-	7	-	-	4	220			11
X	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	60			3
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	00%	00%	
'89	00%	00%	00%	
'96	11%	06%	11%	-22%
'02	00%	00%	29%	

Total Plants/Acre (excluding Dead & Seedlings)				
'83	0	Dec:		0%
'89	0			0%
'96	360			22%
'02	280			79%

Chrysothamnus viscidiflorus viscidiflorus																		
M	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	02	1	-	-	-	-	-	-	-	-	1	-	-	-	20	8	11	1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	00%	00%	
'89	00%	00%	00%	
'96	00%	00%	00%	
'02	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)			
'83	0	Dec:	-
'89	0		-
'96	0		-
'02	20		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Gutierrezia sarothrae																		
S	83	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	96	5	-	-	-	-	-	-	-	-	5	-	-	-	100			5
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	83	2	-	-	-	-	-	-	-	-	2	-	-	-	133			2
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	96	26	-	-	-	-	-	-	-	-	26	-	-	-	520			26
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	83	4	-	-	-	-	-	-	-	-	4	-	-	-	266	11	11	4
	89	19	-	-	-	-	-	-	-	-	19	-	-	-	1266	10	15	19
	96	199	-	-	-	-	-	-	-	-	199	-	-	-	3980	9	13	199
	02	20	-	-	-	-	-	-	-	-	20	-	-	-	400	9	8	20
D	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	6	-	-	-	-	-	-	-	-	4	-	-	2	120			6
X	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	320			16

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	00%	00%	+68%
'89	00%	00%	00%	+72%
'96	00%	00%	00%	-88%
'02	00%	00%	08%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'83	399	Dec:	0%
	'89	1266		0%
	'96	4500		0%
	'02	520		23%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Opuntia spp.																		
Y	83	2	-	-	-	-	-	-	-	-	2	-	-	-	133			2
	89	2	-	-	-	-	-	-	-	-	2	-	-	-	133			2
	96	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	02	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
M	83	5	-	-	-	-	-	-	-	-	5	-	-	-	333	6	14	5
	89	9	1	-	-	-	-	-	-	-	10	-	-	-	666	7	22	10
	96	13	-	-	4	-	-	-	-	-	17	-	-	-	340	5	18	17
	02	13	-	-	2	-	-	-	-	-	15	-	-	-	300	5	11	15
D	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	96	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	02	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	00%	00%	+42%
'89	08%	00%	00%	-47%
'96	00%	00%	00%	-10%
'02	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'83	466	Dec:	0%
	'89	799		0%
	'96	420		10%
	'02	380		11%